

IN THE CLAIMS:

1 1. (Currently Amended) A system configured to simplify management of a clustered
2 storage system having a plurality of failover modes, the system comprising:

3 a user interface system that ~~defines~~ allows a user to define a plurality of failover
4 modes in a clustered storage system, wherein each failover mode automatically config-
5 ures one or more ports on a selected storage system or a partner storage system in re-
6 sponse to a failover condition, wherein the partner storage system is configured to receive
7 requests directed to the partner storage system and the selected storage system; and

8 a command set implemented by the user interface system, ~~and including a com-~~
9 ~~mand for a user~~ configured to set a cluster mode, ~~where the cluster mode includes includ-~~
10 ~~ing at least one of the plurality of failover modes, wherein each failover mode configures~~
11 ~~the partner storage system with a world wide node name and a world wide port name~~
12 ~~from the selected storage system to allow the partner storage system to assume an identity~~
13 ~~of the selected storage system, wherein the partner storage system is configured to re-~~
14 ~~ceive requests directed to the partner storage system and the selected storage system in~~
15 which a storage systems is to operate, wherein the command set further provides informa-
16 tion specific to the failover operations of the one or more ports to the user on the user in-
17 terface system.

1 2. (Previously Presented) The system of claim 1 wherein the user interface system com-
2 prises a command line interface (CLI) configured to support the command set.

1 3. (Original) The system of claim 1 wherein the command set further comprises an igroup
2 command that determines whether a set of initiators may utilize data access command
3 proxying.

1 4. (Original) The system of claim 3 wherein the set of initiators comprises at least one
2 fibre channel world wide name.

- 1 5. (Original) The system of claim 3 wherein the set of initiators comprises one or more
2 iSCSI identifiers.
- 1 6. (Original) The system of claim 3 wherein the igroup command sets an igroup option to
2 determine whether members of a set of initiators may use a partner port for proxying data
3 access command.
- 1 7. (Original) The system of claim 3 wherein the command set further comprises a cfmode
2 command that sets a cluster mode for the clustered storage system.
- 1 8. (Original) The system of claim 7 wherein the cluster mode enables the clustered stor-
2 age system to proxy data access requests received by a first storage system in the clus-
3 tered storage system to a second storage system in the clustered storage system.
- 1 9. (Original) The system of claim 7 wherein the cluster mode enables a first storage sys-
2 tem in the clustered storage system to assume an identity of a second storage system in
3 the clustered storage system.
- 1 10. (Original) The system of claim 7 wherein the cluster mode enables proxying of data
2 access requests received by a first storage system in the clustered storage system to a sec-
3 ond storage system in the clustered storage system and further enables the first storage
4 system to assume an identity of the second storage system.
- 1 11. (Original) The system of claim 1 wherein the command for setting a cluster mode
2 comprises a cfmode command.
- 1 12. (Original) The system of claim 1 wherein the user interface system further comprises
2 a graphical user interface having functionality to implement the command set.

1 13. (Currently Amended) A method for simplifying management of a clustered storage
2 system having a plurality of failover modes, comprising:

3 providing a user interface system that allows a user to define a plurality of
4 failover modes in a clustered storage system; and

5 executing a command set supported by the user interface system to set a cluster
6 mode for the clustered storage system, the cluster mode defining one of a plurality of
7 failover modes in which a storage systems is to operate, wherein the command set further
8 provides information specific to the failover operations of the one or more ports to the
9 user on the user interface system, and each failover mode automatically configures one or
10 more ports on a selected storage system or a partner storage system in response to a
11 failover condition, ~~wherein each failover mode configures a partner storage system with a~~
12 ~~world wide node name and a world wide port name from a failed storage system and, the~~
13 partner storage system is configured to receive requests directed to the partner storage
14 system and the failed storage system.

1 14. (Original) The method of claim 13 wherein the cluster mode comprises a partner
2 mode; and

3 wherein the clustered storage system is enabled to proxy data access requests re-
4 ceived by a first storage system in the clustered storage system to a second storage sys-
5 tem.

1 15. (Original) The method of claim 13 wherein the cluster mode comprises a standby
2 mode; and

3 wherein a first storage system in the clustered storage system is enabled to assume
4 an identity of a second storage system in the clustered storage system.

1 16. (Previously Presented) The method of claim 13 further comprising providing a GUI
2 implementing commands available through the user interface system.

1 17. (Previously Presented) The method of claim 13 further comprising providing a GUI
2 window for setting a cluster mode of the clustered storage system.

1 18. (Previously Presented) The method of claim 16 further comprising providing a GUI
2 window for setting a proxy option for an initiator group.

1 19. (Currently Amended) A system configured to simplify management of a clustered
2 storage system having a plurality of failover modes, the system comprising:
3 a user interface means for implementing a command line interface that allows a
4 user to define a plurality of failover modes in a clustered storage system; and
5 means for executing a command set to set~~setting~~ a cluster mode, the cluster mode
6 defining one of a plurality of failover modes in which a storage systems is to operate,
7 wherein the command set further provides information specific to the failover operations
8 of the one or more ports to the user on the user interface system, and each failover mode
9 automatically configures one or more ports on a selected storage system or a partner stor-
10 age system in response to a failover condition,~~wherein each failover mode configures a~~
11 ~~partner storage system with a world wide node name and a world wide port name from a~~
12 ~~failed storage system, and,~~ the partner storage system is configured to receive requests
13 directed to the partner storage system and the failed storage system.

1 20. (Original) The system of claim 19 further comprising means for determining whether
2 a set of initiators may utilize data access command proxying.

1 21. (Original) The system of claim 19 wherein user interface means further comprises
2 means for determining whether a set of initiators may utilize data access command
3 proxying.

1 22. (Original) The system of claim 21 wherein the set of initiators comprises at least one
2 fibre channel world wide name.

1 23. (Original) The system of claim 21 wherein the set of initiators comprises one or more
2 iSCSI identifiers.

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1 24. (Original) The system of claim 19 wherein the cluster mode enables the clustered
2 storage system to proxy data access requests received by a first storage system in the
3 clustered storage system to a second storage system in the clustered storage system.

1 25. (Original) The system of claim 19 wherein the cluster mode enables a first storage
2 system in the clustered storage system to assume an identity of a second storage system
3 in the clustered storage system.

1 26. (Original) The system of claim 19 wherein the cluster mode enables proxying of data
2 access requests received by a first storage system in the clustered storage system to a sec-
3 ond storage system in the clustered storage system and further enables the first storage
4 system to assume an identity of the second storage system.

1 27. (Currently Amended) A computer readable storage device having stored thereon pro-
2 gram instructions executing on a computer, for simplifying management of a clustered
3 storage system having a plurality of failover modes, wherein the program instructions
4 when executed by the computer perform the steps of:

5 providing a user interface system that allows a user to define a plurality of
6 failover modes in a clustered storage system; and

7 executing a command set supported by the user interface system to set a cluster
8 mode for the clustered storage system, the cluster mode defining one of a plurality of
9 failover modes in which a storage systems is to operate, wherein the command set further
10 provides information specific to the failover operations of the one or more ports to the

11 user on the user interface system, and each failover mode automatically configures one or
12 more ports on a selected storage system or a partner storage system in response to a
13 failover condition, ~~wherein each failover mode configures a partner storage system with a~~
14 ~~world wide node name and a world wide port name from a failed storage system, and the~~
15 partner storage system is configured to receive requests directed to the partner storage
16 system and the failed storage system.

1 28. (Original) The computer readable medium of claim 27 wherein the cluster mode
2 comprises a partner mode; and
3 wherein the clustered storage system is enabled to proxy data access requests re-
4 ceived by a first storage system in the clustered storage system to a second storage sys-
5 tem.

1 29. (Original) The computer readable medium of claim 27 wherein the cluster mode
2 comprises a standby mode; and
3 wherein a first storage system in the clustered storage system is enabled to assume
4 an identity of a second storage system in the clustered storage system.

1 30. (Original) The computer readable medium of claim 27 further comprising the step of
2 providing a GUI implementing commands available through the user interface system.

1 31. (Original) The computer readable medium of claim 27 further comprising the step of
2 providing a GUI window for setting a cluster mode of the clustered storage system.

1 32. (Original) The computer readable medium of claim 27 further comprising the step of
2 providing a GUI window for setting a proxy option for an initiator group.

1 33. (Currently Amended) A system, comprising:

an interface that defines a plurality of failover modes for a clustered storage system that allows a user to define a plurality of failover modes in a clustered storage system; and

a command set implemented by the interface, wherein the command set includes a command for setting a cluster mode using one of the plurality of failover modes, in which a storage systems is to operate, wherein the command set further provides information specific to the failover operations of the one or more ports to the user on the user interface system, and each failover mode automatically configures one or more ports on a selected storage system or a partner storage system in response to a failover condition,
~~wherein each failover mode configures a partner storage system with a world wide node name and a world wide port name from a failed storage system, and the partner storage system is configured to receive requests directed to the partner storage system and the failed storage system.~~

34. (Previously Presented) The system of claim 33, wherein the interface comprises a command line interface (CLI) configured to support the command set.

35. (Previously Presented) The system of claim 33, wherein the command set further comprises an igroup command that determines whether a set of initiators may utilize data access command proxying.

36. (Previously Presented) The system of claim 35, wherein the set of initiators comprises at least one fibre channel world wide name.

37. (Previously Presented) The system of claim 35, wherein the set of initiators comprises one or more iSCSI identifiers.

1 38. (Previously Presented) The system of claim 35, wherein the igroup command sets an
2 igroup option to determine whether members of a set of initiators may use a partner port
3 for proxying data access command.

1 39. (Previously Presented) The system of claim 33, wherein the cluster mode enables the
2 clustered storage system to proxy data access requests received by a first storage system
3 in the clustered storage system to a second storage system in the clustered storage system.

1 40. (Previously Presented) The system of claim 33, wherein the cluster mode enables a
2 first storage system in the clustered storage system to assume an identity of a second
3 storage system in the clustered storage system.

1 41. (Previously Presented) The system of claim 33, wherein the cluster mode enables
2 proxying of data access requests received by a first storage system in the clustered stor-
3 age system to a second storage system in the clustered storage system and further enables
4 the first storage system to assume an identity of the second storage system.

1 42. (Currently Amended) A method, comprising:

2 providing an interface that ~~defines a plurality of failover modes for a clustered~~
3 ~~storage system, to define a plurality of failover modes in a clustered storage system~~

4 wherein the cluster storage system includes a plurality of servers;

5 selecting a command set supported by the interface to set a cluster mode for the
6 clustered storage system, the cluster mode defining one of a plurality of failover modes in
7 which a storage systems is to operate, wherein the command set further provides informa-
8 tion specific to the failover operations of the one or more ports to the user on the user in-
9 terface system, and each failover mode automatically configures one or more ports on a
10 selected storage system or a partner storage system in response to a failover condition,
11 ~~wherein each failover mode configures a partner server with a world wide node name and~~

12 ~~a world wide port name from a failed server, and the partner server is configured to re-~~
13 ~~ceive requests directed to the partner server and the failed server; and~~
14 ~~configuring the clustered storage system into the selected cluster mode.~~

1 43. (Previously Presented) The method of claim 42, wherein the interface is a command
2 line interface.

1 44. (Previously Presented) The method of claim 42, wherein the interface is a graphical
2 user interface.

1 45. (Previously Presented) The method of claim 42, wherein the selected cluster mode
2 enables the clustered storage system to proxy data access requests received by a first stor-
3 age system in the clustered storage system to a second storage system in the clustered
4 storage system.

1 46. (Previously Presented) The method of claim 42, wherein the selected cluster mode
2 enables a first storage system in the clustered storage system to assume an identity of a
3 second storage system in the clustered storage system.

1 47. (Previously Presented) The method of claim 42, wherein the cluster mode enables
2 proxying of data access requests received by a first storage system in the clustered stor-
3 age system to a second storage system in the clustered storage system and further enables
4 the first storage system to assume an identity of the second storage system.

1 48. (Currently Amended) A system configured to simplify management of a clustered
2 storage system having a plurality of failover modes, the system comprising:
3 an interface system that to define a plurality of failover modes in a clustered stor-
4 age system~~defines a plurality of failover modes for use in the cluster storage system~~
5 automatically responding to a failover condition, wherein each failover mode configures

6 one or more ports on a selected server or a partner server in response to a failover condi-
7 tion, the partner server is configured to receive requests directed to the partner server and
8 the selected server; and

9 a command set implemented by the interface system and including a command for
10 setting a cluster mode where the cluster mode includes one of the plurality of failover
11 modes in which a storage systems is to operate, wherein the command set further pro-
12 vides information specific to the failover operations of the one or more ports to the user
13 on the user interface system, ~~wherein each failover mode configures a partner server~~
14 ~~with a world wide node name and a world wide port name from the selected server, and~~
15 ~~the partner server is configured to receive requests directed to the partner server and the~~
16 ~~selected server.~~

1 49. (Previously Presented) The system of claim 48, wherein the plurality of failure
2 modes comprises a standby mode, a partner mode, a dual fabric mode, and a mixed
3 mode.

1 50. (Currently Amended) A system, comprising:

2 a first server configured with one or more ports to send and receive messages
3 from one or more clients and the first server connected to a first set of storage devices
4 and a second set of storage devices, wherein the first server is configured to own the first
5 set of storage devices;

6 a second server configured with one or more ports to send and receive messages
7 from one or more clients and the second server connected to the first set of storage de-
8 vices and the second set of storage devices, wherein the second server is configured to
9 own the second set of storage devices;

10 the first server further configured with an interface system that allows a user to
11 define a plurality of failover modes in a clustered storage system, the failover modes that
12 ~~defines a plurality of failover modes~~, wherein each failover mode automatically config-
13 ures the one or more ports on the first server or the second server in response to a failover

14 condition, and the second server is configured to receive requests directed to the second
15 server and the first server; and

16 a command set implemented by the interface system and including a command for
17 a user to set a cluster mode where the cluster mode includes at least one of the plurality of
18 failover modes in which a storage systems is to operate, wherein the command set further
19 provides information specific to the failover operations of the one or more ports to the
20 user on the user interface system, ~~wherein each failover mode configures a port on the~~
21 ~~second server with a world wide node name and a world wide port name from the first~~
22 ~~server to allow the port of the second server to assume an identity of the first server, and~~
23 ~~the second server is configured to receive requests directed to the second server and the~~
24 ~~first server.~~

1 51. (Previously Presented) The system of claim 50, where in the plurality of failover
2 modes comprise a STANDBY mode, a PARTNER mode, a DUAL_FABRIC mode, and
3 a MIXED mode.

1 52. (Previously Presented) The system of claim 51, wherein the STANDBY mode utilizes
2 standby ports on the first server to allow a second port on the second server to receive
3 and handle data access requests directed to the first server.

1 53. (Previously Presented) The system of claim 51, wherein the PARTNER mode utilizes
2 one or more ports on the second sever for data access proxying.

1 54. (Previously Presented) The system of claim 51, wherein the DUAL_FABRIC mode
2 utilizes one or more virtual ports on the second server to emulate additional active ports
3 for clients.

1 55. (Previously Presented) The system of claim 51, wherein the MIXED mode utilizes
2 standby ports on the first server and one or more ports on the second sever for data access
3 proxying.

1 56. (Currently Amended) A system, comprising:

2 a first server configured with a first port to send and receive messages from one or
3 more clients and the first server connected to a first set of storage devices and a second
4 set of storage devices, wherein the first server is configured to own the first set of storage
5 devices and the first port is configured with a world wide port name and the first server is
6 configured with a world wide node name;

7 a second server configured with a first port to send and receive messages from
8 one or more clients and the second server connected to the first set of storage devices and
9 the second set of storage devices, wherein the second server is configured to own the sec-
10 ond set of storage devices;

11 the second server is further configured with a second port;

12 the first server further configured with an interface system that allows a user to
13 define a plurality of failover modes in a clustered storage system, the failover ~~that defines~~
14 ~~a plurality of failover modes~~, wherein each failover mode automatically configures the
15 second port on the second server in response to a failover condition, and the second
16 server is configured to receive requests directed to the second server and the first server;
17 and

18 a command set implemented by the interface system and including a command for
19 a user to set a cluster mode where the cluster mode includes at least one of the plurality of
20 failover modes in which a storage systems is to operate, wherein the command set further
21 provides information specific to the failover operations of the one or more ports to the
22 user on the user interface system, ~~wherein each failover mode configures the second port~~
23 ~~on the second server with the world wide node name and the world wide port name of the~~
24 ~~first server to allow the second port of the second server to assume an identity of the first~~

25 ~~server, and the second server is configured to receive requests directed to the second~~
26 ~~server and the first server.~~

1 57. (Previously Presented) The system of claim 56, wherein the second port on the sec-
2 ond server is a virtual port.

1 58. (Previously Presented) The system of claim 56, wherein the second port on the sec-
2 ond server is a physical port.